b: selecting a desired percentage of conversion of the membrane polymer from an initial amorphous state to a crystalline stage;

c: holding said membrane at the elevated temperature for a predetermined interval, wherein the predetermined interval has been selected to permit the desired percentage conversion of amorphous to crystalline material; and

d: returning the membrane to ambient temperature.

13. The method of claim 12 wherein the said operating temperature is below the glass transition temperature of said membrane.

14. The method of claim 12 wherein the elevated temperature is above the glass transition temperature of said membrane.

15. The method of claim 12 wherein the operating temperature of said membrane is at least about 130°C.

16. The method of claim 12 wherein the percentage of crystalline phase is determined using X-ray spectroscopy.

17. The method of claim 12 wherein said temperature is also at least as high as the intended operating temperature.

18. The method of claim 12 wherein the polymer comprises a hydrocarbon bearing fluorine and sulfate group.--

19. The method of claim 12 wherein the polymer comprises a perfluorocarbosulfonic acid polymer.

20. A membrane for a fuel cell that is capable of operating in the range of 100° to about 160°C wherein the membrane is